

## A new species of *Nychogomphus* (Anisoptera: Gomphidae) from Yunnan Province, China

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*Nychogomphus yangi* sp. nov. is described from Yunnan, China (holotype ♂: Xishangbanna, Yunnan Province, China; deposited at the Shaanxi Bioresource Key Laboratory, Hanzhong, Shaanxi, China). The new species is described and illustrated and compared with its closest congener *Nychogomphus lui*.

<http://zoobank.org/urn:lsid:zoobank.org:pub:CE55CED1-A0A8-4C3A-94E3-C5D2B1CDD067>

**Keywords:** Anisoptera; Gomphidae; *Nychogomphus*; new species; Yunnan; China

### Introduction

The genus *Nychogomphus* Carle has six species (Schorr & Paulson, 2013). Species belonging to the genus are confined to India, Vietnam and China. Species known from China include: *Nychogomphus bidentatus* (Yang, Mao & Zhang, 2010), *N. duaricus* (Fraser, 1924), *N. flavicaudus* (Chao, 1982), *N. geometricus* (Selys, 1854), *N. lui* (Zhou, Zhou & Li, 2005) and *N. striatus* (Fraser, 1924) (Yang, Mao, & Zhang, 2010; Zhao, 1990; Zhou, Zhou, & Lu, 2005). A new species of *Nychogomphus*, collected from Xishuangbanna, Yunnan Province in 2010, is described below.

*Nychogomphus yangi* sp. nov. (Figures 1–9)

**Material.** Holotype: ♂, Xishangbanna, Yunnan Province (22°01' N, 100°48' E, 620 m), 4 July 2010, leg. Hong-jie Zhang. Paratype: ♀, same data. The holotype and paratype have been deposited in the Shaanxi Bioresource Key Laboratory, Hanzhong, Shaanxi, China.

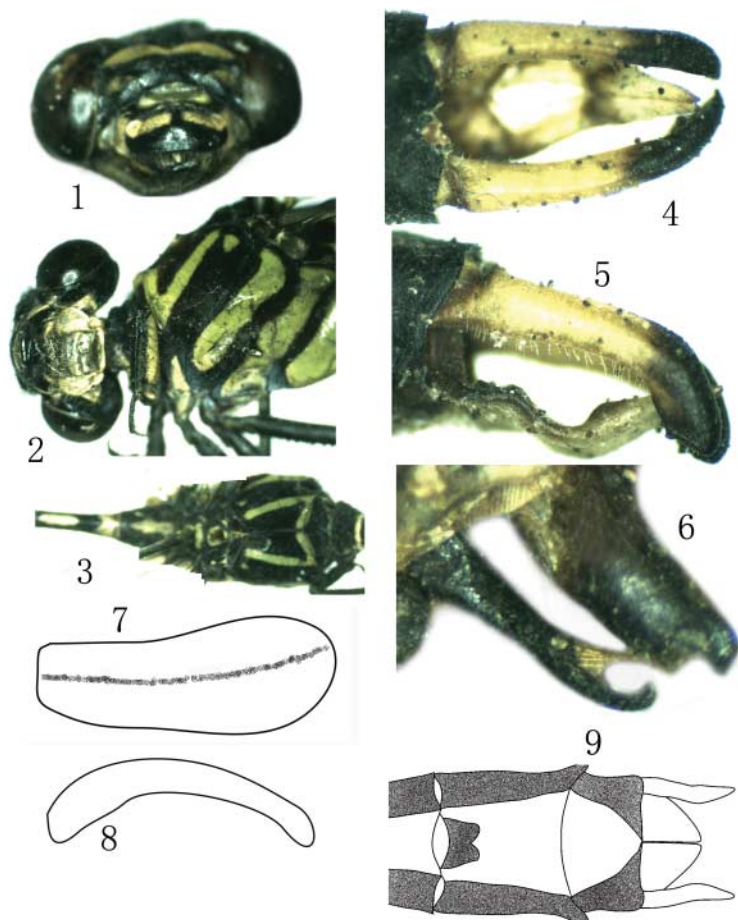
**Etymology.** This species is named in honor of Dr. Zu-de Yang.

### Male

**Head.** Labium pale yellow with some faint black stripes (Figure 2). Mandibles black with pale yellow bases. Labrum black at its base with one pair of yellow transverse stripes at its base.

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Figures 1–9. *Nychogomphus yangi* sp. nov. 1. Head, anterior. 2. Head, ventral, and synthorax, lateral. 3. Synthorax and abdominal S1–3, dorsal. 4. Caudal appendages, dorsal. 5. Caudal appendages, lateral. 6. Posterior and anterior hamuli, ventral. 7. Distal segment of penile organ, ventral. 8. Distal segment of penile organ, lateral. 9. Female abdominal terminal, ventral.

Anteclypeus greenish yellow. Postclypeus black at side with one pair of yellow spots. Frons black, dorsal surface with one pair of lunular yellow transverse stripes (Figure 1). Crest and occiput black. There is a prominence along the inner side of each lateral ocellus. Occipital margin with long black hairs.

**Thorax.** Prothorax black with frontal margin yellow at frontal lobe. Synthorax black with yellow dorsal 7-shaped stripes, formed from collar stripe and dorsal stripe (Figures 2, 3), with collar stripe interrupted medially. Antehumeral stripes each reduced to posterodorsal and anteroventral spot. Side of synthorax with broad yellow stripes at mesepimeron, metepisternum, and metepimeron (Figure 2). Legs black. Wings hyaline with black pterostigma, pterostigma subtending 4–4.5 cells. Antenodals in forewing 9–10, in hind wing 10–11. Postnodals in forewing 13–14, in hind wing 9–10. Anal triangle three cells.

**Abdomen.** Abdomen black with yellow stripes. S1–6 each with yellow stripe along dorsal carina, broad and rectangular on S1 and extending base to apex, on S2 from base to two-thirds its length, S3–6 each with narrow stripe near midlength, the stripes gradually becoming shorter posteriorly. S3–7 each also with basal ring, separate from mid-dorsal stripe (Figure 3). Ring of S7 broad,

extending from base to almost middle in S7. S8–10 entirely black. S1 mostly greenish yellow in lateral view, S2 yellow from auricle to posterior end.

*Anal appendages* (Figures 4, 5). Superior anal appendages yellow with terminal one-third black, curving downwards in distal one-third, with a subterminal tooth in lateral view. Inferior appendages yellow in dorsal view, and yellow-brown in lateral view; the inferior appendages dip downwards medially in lateral view, and are triangular-shaped distally in dorsal view.

*Secondary genitalia* (Figures 6–8). Posterior and anterior hamuli are illustrated in Figure 6. The distal segment of the penile organ is illustrated in Figures 7, 8. The distal segment of the penile is sole-shaped in ventral view, with no flagellum.

### *Female*

Similar to male, but dorsal stripes of S1 triangular, terminal of dorsal stripes of S2 acute, ringed stripes of S3–7 confined to basal one-fourth of segment. Tip of vulva lamina with central U-shape concavity (Figure 9).

### *Measurements*

Male. Abd. 40.0 mm, hw 32.0 mm. Female abd. 43.0 mm, hw 34.0 mm.

### *Differential diagnosis*

The new species is similar to *N. lui*, especially the shape of the inferior anal appendages when viewed laterally, but the distal segment of the penile organ of *N. yangi* is sole-shaped in ventral view with no flagellum, whereas the penile organ of *N. lui* is about pentagon-shaped with one pair of flagella. The superior anal appendage of the new species has one tooth and the anal triangle is three cells compared with *N. lui* which has superior anal appendage with two teeth and anal triangle with four cells. Posterior hamuli of the new species are coniform with tip depressed and not T-shaped, whereas the posterior hamuli of *N. lui* is T-shaped in ventral view.

### *Remarks*

The inferior anal appendages of *N. lui* and *N. yangi* dip downwards medially in lateral view, whereas the inferior anal appendages of the other species of *Nychogomphus* are straight. So the members of *Nychogomphus* may be divided into two groups by the shape of the inferior anal appendages, namely the *lui* group and the *flavicaudus* group. The *lui* group includes *N. lui* and *N. yangi* and the *flavicaudus* group includes *N. bidentatus*, *N. duaricus*, *N. flavicaudus*, *N. geometricus* and *N. striatus*.

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